THE SPECIFICATION

Please amend the specification as follows:

--[0016] The process in this invention includes the iterative calculation of correlation and power. In this case the correlation calculated iteratively is referred to as P(d) and power calculated iteratively is referred to as R(d), where d refers to the moment of calculation of the correlation. In this case, the samples received are stored in the receiver and furthermore, the partial products are also stored, the iterative calculation of the correlation P(d) is undertaken by means of the following algorithm:

$$P(d) = P(d-1)+(r_d r^*_{d-(N+L)})-(r_{d-N} r^*_{d-(N+L)-N})$$

And the calculation of the power R(d) by means of the following algorithm:

$$\cancel{R(d)=R(d-1)+\bullet r_d \bullet^2 - \bullet r_{d-N} \bullet^2}$$

$$\underline{R(d)=R(d-1)+|r_d|^2 - |r_{d-N}|^2}$$

where r(d) is the current sample, r_{d-N} is the sample that arrives at the receiver N samples before; N is the number of samples in one of the symbols in the synchronization sequence; $r^*_{d-(N+L)}$ the complex conjugation of the sample received N+L samples previously and $r^*_{d-(B+L)-N}$ the complex conjugation of the samples received 2N+L samples previously, where L is the number of cyclic prefix samples of the OFDM symbol. --

--[0057] To carry out synchronization in the receivers it is necessary in the first place to detect the

synchronization sequence and for which the synchronization control module 15 applies the maximum likelihood criteria to the samples obtained at the exit to the decimator 9. This criterion is known in the state of the art for other applications and is defined by the following algorithm:

$$\cancel{\bullet(\bullet,\bullet)= \bullet\gamma(\bullet)\bullet \cos(2\pi\bullet + <\gamma(\bullet))\cdot\bullet\bullet(\bullet)}$$

$$\underline{\Lambda(\theta,\varepsilon)= |\underline{\gamma}(\theta)| \cos(2\pi\varepsilon + <\underline{\gamma}(\theta))\cdot\rho\xi(\theta)}$$

Where [[•]] $\underline{\theta}$ is the moment of the sample, [[•]] $\underline{\varepsilon}=\Delta f^{*}(T_s+T_{cp})$ (where T_s is time of transmission and reception of a symbol and T_{cp} the time of the cyclic prefix) the difference between the transmission and reception oscillators multiplied by the time difference between the two intervals that are correlated to find similarities and,

$$\rho = \frac{\sigma_s^2}{\sigma_s^2+\sigma_n^2} = \frac{SNR}{SNR+1} \cong 1$$

$$\gamma(m) = \sum_{k=m}^{m+l-1} r(k) r*(k+n)$$

$$\xi(m) = \frac{1}{2}\sum_{k=m}^{m+l-1}\left(|r(k)|^2 + |r(k+n)|^2\right) \cong \sum_{k=m}^{m+l-1} |r(k)|^2$$

Where l is the number of samples of the intervals whose similarity we are looking for, and n is the number of samples that are found in phase out. In this case l=N and n=N+L where N is the number of samples of one of the symbols of the synchronization sequence, and L the number of cyclic prefix samples. Therefore γ is the correlation of the two intervals of N samples separated N+L and ξ the power of N samples.—

--[0059] For time synchronization the correlation maximum (γ) is used. By this means it is possible to obtain the optimum moment:[[•]] $\underline{\theta}_{opt}$.

[0060] In frequency synchronization the cosine is maximum when:

$$\hat{\varepsilon}(\theta_{opt}) = -\frac{1}{2}\angle\gamma(\theta_{opt}) + n$$

Where ε is an estimate of frequency offset on translating the signal in band, that is, a frequency error equal for all tones (carriers) in the signal. Taking n=0 in the previous equation the result is that [[•]]$\underline{\Delta}f_s<1/ (T_s+T_{cp})$, and substituting ε for its value, we obtain:

$$\cancel{\angle\bullet(\bullet_{opt})=\text{-}2\pi\bullet f(T_s+T_{cp})}$$

$$\underline{\angle\gamma(\theta_{opt})=\text{-}2\pi\Delta f(T_s+T_{cp})}$$

[0061] This development presupposes a translation to analog band and therefore displacement is equal in all carriers. This type of error does not exist in this invention due to the fact that the analog signal is not translated in band. Notwithstanding this sampling, frequency error exists, which gives rise to displacement in frequency that is different in each and every one of the tones (carriers) in the signal. However, due to the fact that this displacement is of the same sign in all tones (carriers), ε is proportional to the measure of this error, and can serve as the estimator. In this case, the correlation angle is equivalent to:

$$\cancel{\angle \bullet(\bullet_{opt})=-2\pi f_c M(N+L)\left(\frac{\Delta f_s}{f_s+\Delta f_s}\right)}$$

$$\underline{\angle y(\theta_{opt})=-2\pi f_c M(N+L)\left(\frac{\Delta f_s}{f_s+\Delta f_s}\right)} \qquad \text{(A)}$$

where M is the interpolation and decimator factor used before and after the converters in transmission and reception, respectively, and f_c the frequency of the digital carrier.--

--**[0067]** The following algorithm represents this mathematically:

$\cancel{P(d)=P(d-1)+(r_n r^*_{d-(N+L)})-(r_{d-N} r^*_{d-(N+L)-N})}$ $\underline{P(d)=P(d-1)+(r_d r^*_{d-(N+L)})-(r_{d-N} r^*_{d-(N+L)-N})}$ for the correlation,

where P(d) is the correlation, r_d the current sample, r_{d-N} the sample that arrived at the receiver N samples before and $r^*_{d-(n+L)}$ the complex conjugation of the sample that arrived at the receiver N+L samples before, and, $r^*_{d-(N+L)-N}$ the complex conjugation of the samples that arrived at the receiver 2N+L samples before.

[0068] Calculation of power may also be carried out iteratively by following a similar process to that for the correlation. In this case the algorithm used will be:

$R(d)=R(d-1)+|r_d|^2\underline{-}|r_{d-N}|^2$ for power;

Where R(d) is power, r_d the current sample, and r_{d-N} the samples that arrived at the receiver N samples before. --

--**[0090]** With the maximum rotation produced in each

carrier with greater frequency fixed by system design and the value of Δf_s as the error in sampling frequency fixed due to the difference between the transmission and reception oscillators in the various equipments, the maximum period between two consecutive measures of the rotated angle in each carrier is fixed so that an estimation of the rotation speed in each carrier without producing overlappings or overflows can be made, when the difference in phase between two consecutive rotated angles in the same carrier is less than 180º (π radians). Mathematically this period may be calculated as:

$$(\bullet_2 - \bullet_1)<\pi \quad \underline{(\theta_2 - \theta_1)<\pi}$$

$$\cancel{\bullet_1=2\pi f_{max\_error}\bullet_1} \quad \underline{\theta_1=2\pi f_{max\ error}\,\tau_1}$$

$$\cancel{\bullet_2=2\pi f_{max\_error}(\bullet_1+T)} \quad \underline{\theta_2=2\pi f_{max\ error}\,(\tau_1+T)}$$

$$\text{So that: } T_{max} < \frac{1}{2f_{max\_error}}$$

--**[0098]** The result of calculating the average of these rotations in all carriers is:

$$\cancel{2\pi f_e M(N+\bullet)}\frac{\Delta f_s}{f_s+\Delta f_s} \quad \underline{2\pi f_c M(N+\Delta)}\frac{\Delta f_s}{\underline{f_s+\Delta f_s}} \quad \cdot\cdot$$

THE DRAWINGS

Please amend the drawings, to enter Replacement Sheets for Figures 1, 2, 3 and 7, in place of the originally filed figures. Marked-up copies of original Figures 1, 2, 3 and 7, labeled "Annotated Sheets" are also enclosed herewith, and clearly depict that text inadvertently omitted from the elements of the Figures as filed, are proponed for insertion herein.